

wherein said contact hole for said storage node is defined by a line/space pattern which intersects perpendicularly to said bit line.

REMARKS

The office action of June 10, 2002 has been carefully reviewed and these remarks are responsive thereto. Reconsideration and allowance of the instant application are respectfully requested. Claims 20-39 remain pending.

Preliminarily, applicants note with appreciation the indication that the application contains allowable subject matter. Specifically, claims 27-29 and 34-39 have been allowed and claims 23 and 24 have been objected to for being dependent upon a rejected base claim, but would be allowable if amended to incorporate all the features of their ultimate base claim and any intervening claims.

Applicants have amended the claims to correct minor informalities discovered therein and to otherwise clarify the invention.

Claims 25 and 26 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants have amended claims 25 and 26 to address this rejection and to otherwise clarify the invention. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 20 and 21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent no. 5,482,894 (Havemann). Claims 22, 31 and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Havemann in view of U.S. patent no. 5,466,639 (Ireland). Claim 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ireland in view of Havemann. Applicants respectfully traverse these rejections.

Claims 20 and 21

The action alleges that Havemann discloses all the features of independent claim 20. As amended, claim 20 recites, among other features, forming a third insulating film at least on a side wall of the conductive film and on a side wall of the first insulating film in the contact hole, wherein the third insulating film is in physical contact with the side walls of the conductive film and the first insulating film in the contact hole. To show the step of forming a third insulating film, the action relies on forming the overlayer 42 on the gate oxide 22 and conformal dielectric 30 as depicted in Fig. 2C of Havemann. However, Havemann fails to teach or suggest the third

insulating film being in *physical contact with the side walls of the conductive film and the first insulating film* in the contact hole as recited in amended claim 20. Indeed, the overlayer 42 is in physical contact with the gate oxide 22 and conformal dielectric 30 and not both the conductors 26 and gate oxide 22, which the action alleges shows the conductive film and the first insulating film. For at least this reason, claim 20 and claim 21, which depends from claim 20, are patentably distinct from Havemann.

Claims 31 and 32

The action contends that Havemann discloses all the features of independent claims 31 and 32, but for forming a line/space pattern on the second insulating film, the line/space pattern being intersected perpendicularly to the first and second conductive films, and either forming a contact hole defined by a line/space pattern and the first and second conductive films (claim 31) or forming a contact hole by etching first and second insulating films using the line/space pattern and the first and second conductive films as a mask (claim 32). To overcome this deficiency, the action relies on Ireland. Specifically, the action alleges that Ireland discloses "a method of forming contacts in semiconductor devices, wherein the method utilizes a line/space photoresist pattern 42 and an insulating layer (14 or 40) underneath the line/space pattern to formed [sic] contact holes." Office Action, page 6.

Contrary to the action's assertion, Ireland does not teach or suggest forming a contact hole either defined by a line/space pattern and the first and second conductive films (claim 31) or by etching first and second insulating films using the line/space pattern and the first and second conductive films as a mask (claim 32). Referring to Fig. 5 of Ireland, the contact hole 52 is defined by the hard mask 14 without the resist layer 42. Indeed, the resist layer 42 defines a trench 50 and not the contact hole 52. As a result, the resist layer 42 is not used as a mask to form the contact hole 52. In light of the foregoing, the combination of Havemann and Ireland, even if proper, does not result in the invention recited in claims 31 and 32. Therefore, claims 31 and 32 are patentably distinct from the combination of Havemann and Ireland.

①

Claim 22

Claim 22 depends from claim 20 and is considered patentably distinct from the applied art for at least the reasons set forth with respect to claim 20. Notably, Ireland fails to overcome the defects of Ireland.

In addition, claim 22 further defines the step of etching and forming the contact hole to include forming a linear/space photo-resist, which intersects perpendicularly to the first and second wirings; and etching the second and first insulating films locally using the said photo-resist and the protective film as a mask. The action relies on the portions of Ireland discussed above with respect to claims 31 and 32, to show these claimed features. However, as expressed above, the resist layer 42 of Ireland is not used as a mask to form the contact hole 52. Hence, for substantially the same reasons set forth above with respect to claims 31 and 32, claim 22 is patentably distinct from the combination of Havemann and Ireland.

Claim 30

The action alleges that Ireland discloses certain, but not all, the features of claim 30 and relies on Havemann to cure the deficiencies of Ireland. Claim 30 calls for, among other features, forming a contact hole in the first insulating layer and the second insulating film located between the first and second wirings, wherein the contact hole is defined by the line/space pattern and the first and second wirings. To show this feature, the action relies on Ireland. As discussed previously with respect to claims 31 and 32, Ireland neither teaches nor suggests forming a contact hole defined by a line/space pattern. As admitted by the action, Havemann lacks a teaching of this claimed feature as well. Hence, the combination of Ireland and Havemann, even if proper, does not result in the invention of claim 30.

CONCLUSION

All rejections having been addressed, applicants respectfully submit that the instant application is in condition for allowance, and respectfully solicit prompt notification of the same.

①


It is believed that no fee is required for this submission. If any fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Dated: September 10, 2002

By:



Gary D. Fedorochko
Registration No. 35,509

1001 G Street, N.W.
Washington, D.C. 20001-4597
(202) 508-9100

GDF:lab

①